

## **Amendments to the Specification**

Please amend the paragraph beginning at page 9, line 18 as follows:

In another aspect of the invention there is provided an optical performance monitor, comprising:

a) an optical isolator having an output optically coupled to ~~[[a]]~~ an input of a means for demultiplexing the input optical signals into a pre-selected number of wavelength bands, each wavelength band containing a pre-selected number of wavelength channels; the optical isolator having an input optically coupled to the input optical signals, the means for demultiplexing the optical signals having a number of outputs equal to the pre-selected number of wavelength bands with each output being optically coupled into an associated optical branching device, each optical branching device having a first circulating port being optically coupled to a first end of an associated length of optical fiber, each optical branching device having an output port optically coupled to an associated detector;

each length of optical fiber having a fiber Bragg grating array including a ~~pre-selected~~ the same number of spatially -separated fiber Bragg gratings, each of the ~~pre-selected number of~~ fiber Bragg gratings having a different associated Bragg wavelength, the length of optical fiber having a second end being a low reflection termination;

tuning means attached to each of the ~~pre-selected number of~~ spatially -separated fiber Bragg gratings for inducing a pre-selected amount of change in both fiber Bragg grating period and refractive index in each fiber Bragg grating for

shifting the associated Bragg wavelengths of each of the ~~pre-selected number of~~ fiber Bragg gratings among a pre-selected number (L) of positions, wherein when a pre-selected fiber Bragg grating in each length of optical fiber is switched to coincide with a pre-selected wavelength channel, the pre-selected wavelength channels in each fiber are reflected back through the optical branching device attached to each length of optical fiber and out through its output port into the associated detector connected thereto, whereupon the wavelength channels of each wavelength band are interrogated to determine pre-selected properties of the optical signals,

wherein each spatially-separated fiber Bragg grating in different optical fibers but in the same corresponding fiber positions is attached to a common tuning means such that all the fiber Bragg gratings in the same corresponding fiber positions are switched at the same time.

Please amend the paragraph beginning at page 14, line 9 as follows:

In another aspect of the present invention there is provided a method of monitoring optical performance of optical signals in an optical fiber, comprising the steps of:

a) demultiplexing optical signals into a pre-selected number (K) of wavelength bands, each wavelength band containing a pre-selected number of wavelength channels;

b) directing the demultiplexed wavelength channels from each of the pre-selected number (K) wavelength bands into an associated optical branching

device and into an a length of optical fiber coupled thereto, each length of optical fiber having a fiber Bragg grating array including ~~a pre-selected number (M)~~ the same number of spatially -separated number of fiber Bragg gratings, each of the ~~pre-selected number of~~ fiber Bragg gratings having a different associated Bragg wavelength and being tunable among a pre-selected number (L) of wavelength positions with each wavelength position coinciding with an associated pre-selected wavelength channel from the wavelength band routed into the length of optical fiber such that each fiber Bragg grating reflects its (L) pre-selected wavelength channels back through the optical branching device attached thereto, the length of optical fiber having a second end being a low reflection termination;

e) ~~c)~~ c) tuning both the period and refractive index of one of the ~~pre-selected number (M)~~ of fiber Bragg gratings in each of the optical fibers for shifting the associated Bragg wavelength of each fiber Bragg grating to coincide with an associated pre-selected wavelength channel from the pre-selected wavelength band such that the pre-selected fiber Bragg grating reflects the associated pre-selected wavelength channel back through its associated optical branching device, and detecting the reflected pre-selected wavelength channel from each wavelength band and interrogating the detected wavelength channels to determine pre-selected properties of the optical signals contained therein;

d) repeating step c) L-1 additional times until L wavelength channels in the pre-selected wavelength band in each length of optical fiber has been reflected back through the optical branching device; and

e) repeating steps c) and d) for each of the ~~pre-selected number (M)~~ of spatially -separated Bragg gratings in each length of optical fiber until all the wavelength channels have been detected;

f) repeating steps b), c) d) and e) for each of the pre-selected number (K) of wavelength bands until all the wavelength channels (N), given by  $N=MKL$ , are detected,

wherein each spatially-separated fiber Bragg grating in different optical fibers but in the same corresponding fiber positions is attached to a common tuning means such that all the fiber Bragg gratings in the same corresponding fiber positions are switched at the same time.

Immediately before the paragraph beginning at page 16, line 1, please add the following new paragraph:

In another aspect of the present invention there is provided an optical performance monitor, comprising:

an optical isolator having an output optically coupled to an input of a means for optically splitting the input optical signals, the optical isolator having an input optically coupled to the input optical signals, the means for splitting the optical signals having a number of outputs equal to a pre-selected number of wavelength bands, each wavelength band containing a pre-selected number of wavelength channels, with each output of said means for optically splitting the input optical signals being optically coupled into an associated optical branching device, each optical branching device having a first circulating port being

optically coupled to a first end of an associated length of optical fiber, each optical branching device having an output port optically coupled to an associated detector;

each length of optical fiber having a fiber Bragg grating array including the same number of spatially -separated fiber Bragg gratings, each of the fiber Bragg gratings having a different associated Bragg wavelength, the length of optical fiber having a second end being a low reflection termination;

tuning means attached to each of the spatially -separated fiber Bragg gratings for inducing a pre-selected amount of change in both fiber Bragg grating period and refractive index in each fiber Bragg grating for shifting the associated Bragg wavelengths of each of the fiber Bragg gratings among a pre-selected number (L) of positions, wherein when a pre-selected fiber Bragg grating in each length of optical fiber is switched to coincide with a pre-selected wavelength channel, the pre-selected wavelength channels in each fiber are reflected back through the optical branching device attached to each length of optical fiber and out through its output port into the associated detector connected thereto, whereupon the wavelength channels of each wavelength band are interrogated to determine pre-selected properties of the optical signals,

wherein each fiber Bragg grating has a pre-selected out-of-band rejection ratio,

and wherein each spatially-separated fiber Bragg grating in different optical fibers but in the same corresponding fiber positions is attached to a

common tuning means such that all the fiber Bragg gratings in the same corresponding fiber positions are switched at the same time.

Immediately after the above-noted new paragraph inserted on page 16, please add the following new paragraph:

In another aspect of the present invention there is provided a method of monitoring optical performance of optical signals in an optical fiber, comprising the steps of:

a) optically splitting optical signals into a number of outputs equal to a pre-selected number (K) of wavelength bands, each wavelength band containing a pre-selected number of wavelength channels;

b) directing the optically splitted wavelength channels into an associated optical branching device and into a length of optical fiber coupled thereto, each length of optical fiber having a fiber Bragg grating array including the same number of spatially -separated number of fiber Bragg gratings, each of the fiber Bragg gratings having a different associated Bragg wavelength and being tunable among a pre-selected number (L) of wavelength positions with each wavelength position coinciding with an associated pre-selected wavelength channel from the wavelength band routed into the length of optical fiber such that each fiber Bragg grating reflects its (L) pre-selected wavelength channels back through the optical branching device attached thereto, the length of optical fiber having a second end being a low reflection termination;

c) tuning both the period and refractive index of one of the fiber Bragg gratings in each of the optical fibers for shifting the associated Bragg wavelength of each fiber Bragg grating to coincide with an associated pre-selected wavelength channel from the pre-selected wavelength band such that the pre-selected fiber Bragg grating reflects the associated pre-selected wavelength channel back through its associated optical branching device, and detecting the reflected pre-selected wavelength channel from each wavelength band and interrogating the detected wavelength channels to determine pre-selected properties of the optical signals contained therein;

d) repeating step c)  $L-1$  additional times until  $L$  wavelength channels in the pre-selected wavelength band in each length of optical fiber has been reflected back through the optical branching device; and

e) repeating steps c) and d) for each of the spatially -separated Bragg gratings in each length of optical fiber until all the wavelength channels have been detected;

f) repeating steps b), c) d) and e) for each of the pre-selected number ( $K$ ) of wavelength bands until all the wavelength channels ( $N$ ), given by  $N=MKL$ , are detected<sub>1</sub>

wherein each spatially-separated fiber Bragg grating in different optical fibers but in the same corresponding fiber positions is attached to a common tuning means such that all the fiber Bragg gratings in the same corresponding fiber positions are switched at the same time.